OOP with C++

Assignment 2

This assignment is individual assignment, every student should submit by himself.

Due: Next Section

1. True or False:

a. The old name of C++ is C with classes.

b. The main purpose of Object Oriented Programming is to encapsulate data members and members function in one container called Class.

c. Object refers to an instance of a predefined Class in action (run time).

d. If you didn't define a Constructor to your Class the compiler will give a syntax error.

e. If you defined a Constructor with n parameters to your Class , you can define new Objects from this class without parameters.

f. Distractor is required if you dynamically allocate memory for a Class's data members.

g. If you didn't state the access specifiers of a Class members. It will be public by default.

h. In C++ you can add function members to a structure.

i. In C++ you must define functions only within the Class definition body.

j. The size of a pointer to a Class object equals this object size in memory.

2. Create a new C++ project to run the following program then answer the questions

```
1   #include <iostream>
2   using namespace std;
3
4   class Triangle
5   {
6
7   protected:
8        float width, height;
9   public:
10       void set_data (float a, float b){
11            width = a;
12            height = b;
13       }
14       float area (){
15            return (width * height / 2);
16       }
17   };
18
19  int main (){
20
21       Triangle tri;
22       tri.set_data (2,5);
23
24       cout << tri.area() << endl;
25       return 0;
26  }
```

    a.   **What is the output of line 24?**

    b.   **Replace line 7 with** `private:` **and recompile your program. What is the result? Explain.**

    c.   **Remove line 9 and recompile your program. What is the result? Explain.**

    d.   **Define a new pointer** `*tri_p` **in line 23 and initialize with the object** `tri`**.**

    e.   **Rewrite this program and replace the** `set_data()` **function by a constructor, and define** `area()` **function to be external function.**

3. Define a class Math which takes float numbers x and y, then create the following methods:

    a. power(x,y) to print x^y

    b. perm(x, y) to print x permutation y.

    c. comb(x,y) to print x combination y.

4. Define a new class Vehicle with the following attributes

    Data attributes:

        a.   **Seats ranging from 2 to 40.**

        b.   **Wheels ranging from 4 to 12.**

        c.   **Engine.**

    Operations attributes:

        a.   **Constructor to initialize the data attributes.**

        b.   **Distractor to clear any data defined dynamically.**

        c.   **Show_specs() function to print all the vehicle information**

After creating this class, define an object v1 of type Vehicle, and initialize seats with 4, wheels with 4, Engine with 1, then print all the information of this vehicle.